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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): K. Aota, et al.

Appln. No. 10/600,614

Filed: June 23, 2003

For: FRICTION STIR WELDING METHOD AND STRUCTURE BODY
FORMED BY FRICTION STIR WELDING

Group: 1725

Examiner: L. Edmondson

REQUEST FOR RECONSIDERATION

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

February 18, 2004

Sir:

In response to the Office Action mailed November 18, 2003, Applicants respectfully submit the following remarks traversing each of the obviousness-type double patenting rejections in the above-mentioned Office Action, these double patenting rejections being set forth in Items 2-4 on pages 2-4 thereof. As will be shown in the following, it is respectfully submitted that the claims cited by the Examiner in copending Application No. 10/054,852, the claims cited by the Examiner in U.S. Patent No. 6,050,474, and the claims cited by the Examiner from possibly U.S. Patent No. 6,378,264, would have neither taught nor would have suggested the presently claimed method and structural body, such that the obviousness-type double patenting rejections are in error.

Thus, the present claims are directed to a friction stir welding method (see claims 1-11) and a structural body (see claims 12 and 13). Of the claims presently in

the application, method claims 1, 3 and 8 are independent claims, and structural body claims 12 and 13 are independent claims.

The method claims recite a method for friction stir welding first and second members, the first member having a first plate, a second plate disposed substantially parallel to the first plate and a third plate connecting the end portion of the first plate and the second plate and disposed substantially orthogonal to the first plate (or substantially orthogonal to the second plate - see claim 8).

Moreover, present claim 1 recites steps of arranging a recessed portion in a connection portion between the third plate and the first plate, opening the recessed portion directed toward an outer side of a thickness direction of the first member and toward the end portion of the first member, and overlapping an end portion of the second member to the recessed portion, to provide an overlapped portion, with friction stir welding being carried out in this condition. Claim 3 contains similar processing steps. Thus, to emphasize, each of claims 1 and 3 of the above-identified application define the steps of arranging a recessed portion in the connecting portion and opening this recessed portion directed toward an outer side of a thickness direction of the first member and toward the end portion of the first member.

Similarly, claim 8 recites arranging one recessed portion in a connection portion between the third plate of the first member and the second plate of the first member and arranging another recessed portion in a connection portion between the third plate of the second member and the second plate of the second member, and opening the one and the another recessed portions directed toward an outer side of a thickness direction respectively of the first and second members and toward the

end portion of the second plate of the first and second members. To emphasize, the one and another recessed portions in claim 8 are provided in the connecting portion, and are opened directed toward an outer side of a thickness direction of the first and second members, respectively, and toward the end portions of the second plate of the first and second members, respectively.

With reference to, e.g., Fig. 7 of the present disclosure, by providing such recessed portions opened as in the present invention, abutting of the members for purposes of friction stir welding is facilitated, and friction stir welding of the abutted members can easily, efficiently and effectively be carried out.

In contrast, and in connection with the obviousness-type double patenting rejection set forth in Item 3 bridging pages 3 and 4 of the Office Action mailed November 18, 2003, claims 6-11 of U.S. Patent No. 6,050,474, which claim a method of friction stir welding, include independent claims 6, 8, 9 and 10. Claims 6 and 8-10 define an abutting step, of abutting an end portion of a first member and an end portion of a second member, with the end portion of the first member (or one of the end portion of the first member and the end portion of the second member) having a raised part which projects from one surface. Claims 6, 8 and 9 specify that the abutting is performed to provide an abutted portion of the end portions of the first and second members.

Claim 10 of U.S. Patent No. 6,050,474 recites a method including an overlapping of a raised portion of a first member and an end portion of a second member, the raised portion projecting in a direction toward the second member from a raised part which projects in a thickness direction of the first member from one face of the first member, the first member being abutted to the end portion of the second

member, to provide the abutted portion of the first member and the end portion of the second member; in connection with claim 10, note, illustratively (and not to be limiting), Figs. 18 and 20 of No. 6,050,474.

It is respectfully submitted that the claims of U.S. Patent No. 6,050,474 being relied upon in rejecting claims 1-4, 6-9 and 11 of the above-identified application under the judicially created doctrine of obviousness-type double patenting, set forth in Item 3 bridging pages 3 and 4 of the Office Action mailed November 18, 2003, would have neither disclosed nor would have suggested the arranging of the recessed portion or the opening of the recessed portion, as in the present claims. More specifically, it is respectfully submitted that the claims of U.S. Patent No. 6,050,474 do not specify such recessed portion, especially its location in the connecting portion, much less wherein such recessed portion is opened, inter alia, directed toward an outer side of a thickness direction and toward an end portion, of the respective member.

In Item 4 on page 4 of the Office Action mailed November 18, 2003, the Examiner has rejected claims 1-5, 8-10, 12 and 13 under the judicially created doctrine of obviousness-type double patenting as unpatentable over claims 3-7, 13-17 and 26-29 "of U.S. Patent No. 6050474". As can be appreciated, there are only fifteen claims in No. 6,050,474; accordingly, the rejection in Item 4 is not understood. Later in Item 4, reference is made to "264 claims"; and it is noted that the Examiner has cited U.S. Patent No. 6,378,264 to Kawasaki, et al. on the Form PTO-892 attached to the Office Action mailed November 18, 2003. Moreover, it is noted that No. 6,378,264 has thirty claims. In the following, the rejection set forth in Item 4 will be discussed with respect to, inter alia, the claims of the U.S. Patent No. 6,378,264;

in any event, if this obviousness-type double patenting rejection set forth in Item 4 on page 4 of the Office Action mailed November 18, 2003, is maintained, it is respectfully requested that the Examiner clarify the record with respect to the claims of which patent are being relied upon.

Based upon the present record, and noting the discussion in connection with recessed portions as set forth previously, it is respectfully submitted that no claims of U.S. Patent No. 6,050,474 would have disclosed or would have suggested the presently claimed subject matter, including arranging the recessed portions in the connecting portions, and the opening of the recessed portions, as in the present method claims; or the recessed portion as in claim 13 (or the one recessed portion and the another recessed portion as in claim 12), with the second member overlapped to the recessed portion or portions from the outer side of the thickness.

U.S. Patent No. 6,378,262 to Kawasaki, et al. discloses a method of manufacturing a structural body, and a structural body. The method includes a preparing step of two hollow frame members in which two sheet face plates are connected with a truss-shaped structure by plural ribs, an end portion of one of the face plates being positioned in the vicinity of an apex of the truss structure, and an end portion of the another of the face plates having a projection or projections which extend beyond the end portion of the one of the face plates. The method claims of No. 6,378,264 also define arranging a connection member between an end portion of the one of the face plates of each of the two hollow frame members, and joining respective end portions of the connection member to a respective end of the face plate (or to the face plates) by friction stir welding. As to the connection member, see, e.g., the structure represented by reference character 30 in Figs. 2, 3, 5, 7 and

9, illustratively. Thus, note that pertinent claims of No. 6,378,264, apparently referred to by the Examiner, require the connection member, with friction stir welding being provided thereto. Other claims of No. 6,378,264 define a hollow frame member, or a structural body, having projecting end portions; see, e.g., reference characters 12b and 22b in Figs. 7 and 9, illustratively.

It is respectfully submitted that such claimed method, hollow frame member and structural body as in No. 6,378,264 would have neither disclosed nor would have suggested the method according to the present invention, including the arranging of the recessed portion or portions, and the opening of the recessed portion or portions, as in the present claims. Noting particularly that the claimed subject matter in the method claims of No. 6,378,264 includes the connection member, it is respectfully submitted that the method therein would have taught away from the presently claimed subject matter.

Present claims 12 and 13, defining a structural body, recite a first member and a second member, the first member having first and second plates and a third plate connecting an end portion of the first plate and an end portion of the second plate and being disposed substantially orthogonal to the first plate. Claims 12 and 13 recite a recessed portion (or portions) being arranged in a connection portion between the third plate of the first member and the first plate (or between the third plate and each of the first and second plates) of the first member, with the second member being overlapped to the recessed portions from an outer side of a thickness direction of the first members, to provide overlapped portions, and with friction stir welding being located at the overlapped portion.

It is respectfully submitted that the claims of No. 6,378,264 apparently relied upon by the Examiner would have neither disclosed nor would have suggested such a structural body as in the present claims, including the recessed portion or portions, inter alia, in a connection portion between the third plate and other plates of the first member, much less overlap of the second member with the recessed portion "from the outer side of the thickness direction of the first member".

In connection with the obviousness-type double patenting rejection set forth in Item 2 on pages 2 and 3 of the Office Action mailed November 18, 2003, it is noted that this is a provisional obviousness-type double patenting rejection; and it is noted that the opportunity remains for amendment of both the claims of the above-identified application and of No. 10/054,852. Note that the claims of No. 10/054,852 referred to in Item 2 on pages 2 and 3 of the Office Action mailed November 18, 2003, as presently in that application, are directed to a friction stir welding method. This friction stir welding method includes abutting end portions of first and second hollow shape members, the first hollow shape member including, inter alia, recessed portions formed respectively to connecting portions where the two face plates of a first hollow member are each connected with the second connecting member, each recessed portion opening outward toward both the width direction and the thickness direction of the hollow shape member, and a groove or projection formed to one recessed portion, and a groove or projection formed to the other recessed portion. In the claims of No. 10/054,842, a projection or groove is formed to one face plate at the end portion of the second hollow shape member and a projection or groove is also formed to the other face plate at the end portion of the second hollow member, and claims of No. 10/054,852 recite the step of inserting the projections to a

corresponding groove, when the first and second hollow shape members are abutted to each other. It is emphasized that No. 10/054,842 requires the recited projections and grooves, shown, illustratively, by reference characters 28 and 18 in Fig. 1 of No. 10/054,842.

The claims of the above-identified application have been previously discussed.

It is respectfully submitted that the subject matter claimed in No. 10/054,852 would have neither disclosed nor would have suggested the presently claimed method, having the arranged recessed portions and the opening of the recessed portions, and, e.g., without the projections or grooves. It is respectfully submitted that No. 10/054,842 as applied by the Examiner defines a separate patentable invention with the, inter alia, projections and grooves, such that the obviousness-type double patenting rejection over specified claims of No. 10/054,842 is improper.

Moreover, it is respectfully submitted that the subject matter claimed in the above-identified application would not have disclosed, nor would have suggested, a method as in No. 10/054,852, including use of members having the projections and grooves; and, moreover, the positive step of inserting a projection to a corresponding groove. Applying the two-way test of obviousness-type double patenting, it is respectfully submitted that the present obviousness-type double patenting rejection is improper.

The contention by the Examiner that claims of No. 10/054,852 recite a "friction stir welding method wherein hollow members with face plates having interlocking (grooves and projections) sections are engaged and placed in abutment and joined

by insertion of a rotary tool inserted within a diameter range", and that this method is taught in instant claims 1-5 and 8-10 without the statement of insertion within a diameter range or range of depth of the recess, is respectively traversed. Contrary to the contention by the Examiner, it is respectfully submitted that the present claims do not recite grooves and/or projections as in the claims of No. 10/054,852, much less the recited insertion step in No. 10/054,852, and it is respectfully submitted that the present claims would have neither taught nor would have suggested the subject matter claimed in No. 10/054,852.

The contention by the Examiner in each of Items 3 and 4 on pages 3 and 4 of the Office Action mailed November 18, 2003, that the claims of the applied U.S. patents and the referred-to claims of the present application are not patentably distinct because a friction stir welding method for welding first and second members is taught with recesses and projections which are overlapped, is respectfully traversed. It is respectfully submitted that the claims of the applied U.S. patents do not disclose, nor would have suggested, the recessed portion(s) in the connecting portion as in the present claims, particularly opening such recessed portion(s) directed, inter alia, toward an outer side of a thickness direction of the first member, and thus would have neither taught nor would have suggested the presently claimed subject matter.

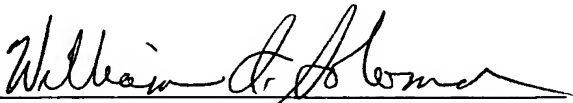
In view of the foregoing comments, reconsideration and withdrawal of the obviousness-type double patenting rejections (both actual and provisional), and allowance of all claims presently in the application, are respectfully requested.

To the extent necessary, Applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in fees due in connection with the filing of

this paper, including extension of time fees, to the Antonelli, Terry, Stout & Kraus, LLP Deposit Account No. 01-2135 (Docket No. 503.35255V13), and please credit any excess fees to such Deposit Account.

Respectfully submitted,

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